SWIMMING POOL HEAT PUMP UNITS

Installation & Instruction Manual

DURA - series

Rev. 1.11
01.07.2014

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1. Preface

In order to provide our customers with quality, reliability and versatility, this product has been made according to strict production standards. This manual includes all necessary information about installation, start-up, winterizing and maintenance. Please read this manual carefully before opening or servicing the unit. The unit must be installed by qualified personnel. The following conditions apply for the warranty to be valid:

- The heat pump can only be installed and serviced by a qualified installer.
- Operation and maintenance must be carried out according to the recommendations featured in this instruction manual.
- Use genuine standard spare parts only.
- Make sure the heat pump is always transported or installed in the correct upright position. In case the heat pump is manipulated in any other position, severe damage can occur.

Failure to comply with these recommendations will invalidate the warranty.

The company will not be held responsible for damage or injury caused by improper installation or incorrect or unnecessary maintenance.

The Swimming Pool Heat Pump Unit heats the swimming pool water and keeps the temperature constant.

Our DURA heat pumps have the following characteristics:

1. Durability

The heat pump is equipped with a PVC & Titanium heat exchanger, which can withstand prolonged exposure to swimming pool water.

2. Easy installation

Before leaving our factory, all our heat pumps are thoroughly tested and made ready-to-use.
Only water and power need to be connected during installation.

3. Silent operation

An extremely efficient rotary/scroll compressor and a low-noise 2-speed fan guarantee silent operation of our heat pumps.

4. Advanced controlling

By means of the electronic control panel, all parameters can be set and the status of all measured variables can be displayed. Remote controlling can also be achieved.

2. Specifications

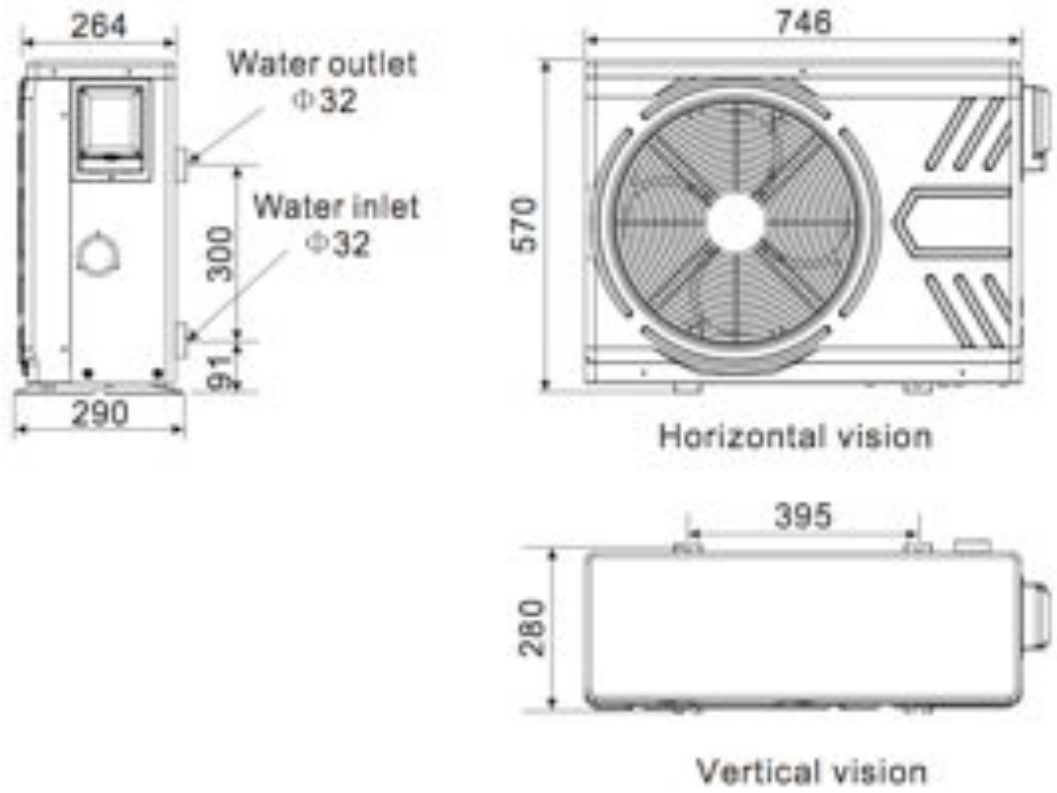
2.1 Technical data sheet

Unit	Model	DURA-7	DURA-10	DURA-13	DURA-18	DURA-22	DURA-22T	DURA-26T
	kW	6,5	9,5	13	18	22	22	26
Heating A25/W25	BTU/h	22200	32400	44500	61500	75000	75000	89000
	kW	6	9	11,8	16,5	20,7	20,7	24,2
Heating A15/W25	BTU/h	20500	30700	42800	59400	72700	72700	83000
Power input	kW	1,1	1,5	2,2	3	3,8	3,8	4,6
Max power input	kW	1,4	2,1	3	3,6	4,5	4,5	5,2
COP A25/W25	C.O.P.	5,9	6,3	6,3	6,3	5,8	5,8	5,7
Maximum volume (1)	m3	30	40	60	80	90	90	130
Running current	A	4,8	6,7	10,4	13,4	16,5	6,7	8,1
Max running current	A	6,4	9,2	14,2	18,7	21	9,7	11,8
Power supply	V/Ph/Hz	220-240/1/50	220-240/1/50	220-240/1/50	220-240/1/50	220-240/1/50	400/3/50	400/3/50
Compressor quantity		1	1	1	1	1	1	1
Compressor type		rotary	rotary	rotary	scroll	scroll	scroll	scroll
Refrigerant		R410A	R410A	R410A	R410A	R410A	R410A	R410A
Refrigerant quantity	Kg	0,8	0,9	1,3	1,8	2,3	2,3	3,2
Pressure gauge		Yes	Yes	Yes	Yes	Yes	Yes	Yes
Fan quantity		1	1	1	1	1	1	1
Fan power input	W	90	120	120	150	200	200	200
Fan speed	RPM	850/750	850/750	850/750	850/750	830/730	830/730	830/730
Air volume	m3/h	2100/1800	2300/2000	2300/2000	3200/2700	5000/4300	5000/4300	5000/4300
Fan direction		horizontal	horizontal	horizontal	horizontal	vertical	vertical	vertical
Noise	dB (A)	50	51	51	54	58	58	58
Water connection	mm	50	50	50	50	50	50	50
Nominal water flow	m3/h	3-5	5-7	6-8	8-10	10-12	10-12	10-12
Max water pressure drop	kPa	12	15	15	16	16	16	16
Net dimensions (L/B/H)	mm	746/290/570	956/372/600	956/372/600	1115/470/870	744/762/980	744/762/980	744/762/980
Shipping dimensions (L/B/H)	mm	850/310/650	1040/415/680	1040/415/680	1120/480/940	805/820/1050	805/820/1050	805/820/1050
Net / shipping weight	kg	35/43	49/61	55/67	117/128	102/130	102/130	102/130

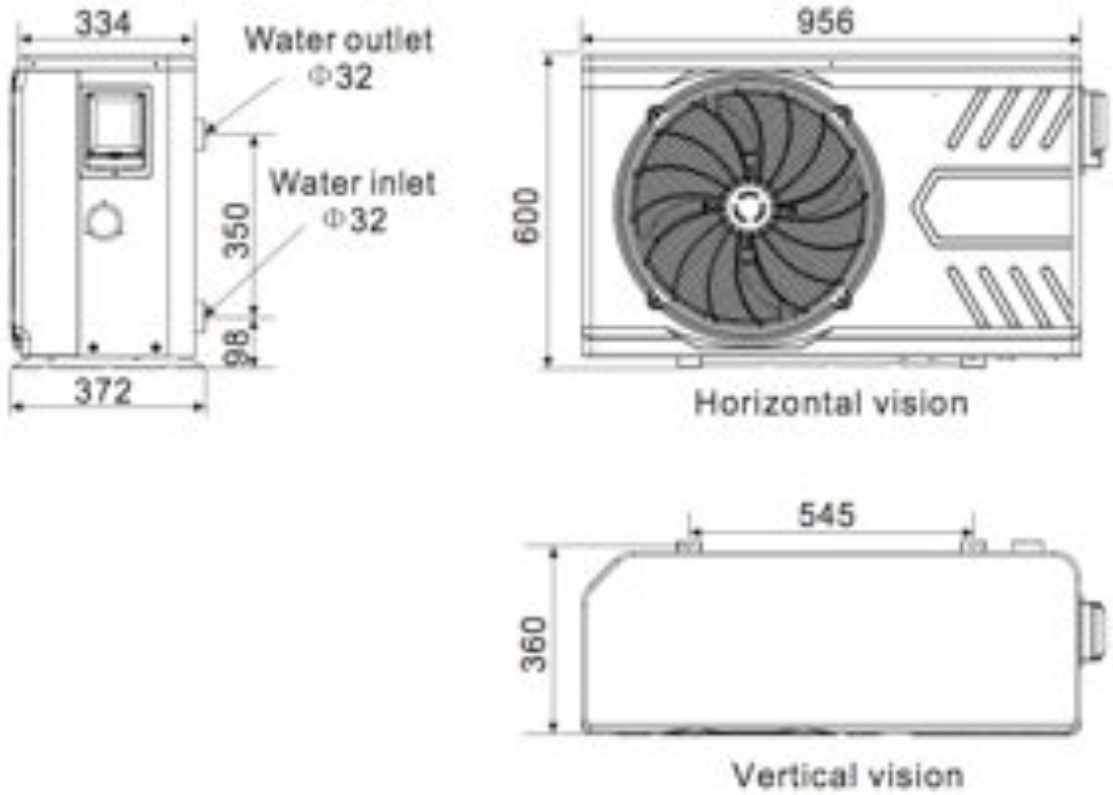
Measuring conditions: Outdoor air temp: 25°C , Inflowing water temp: 25°C, rel. humidity: 65%
(1) : Maximum volume for an entirely insulated pool, with cover, free from wind and exposed to the sun.

2.2 Dimensions

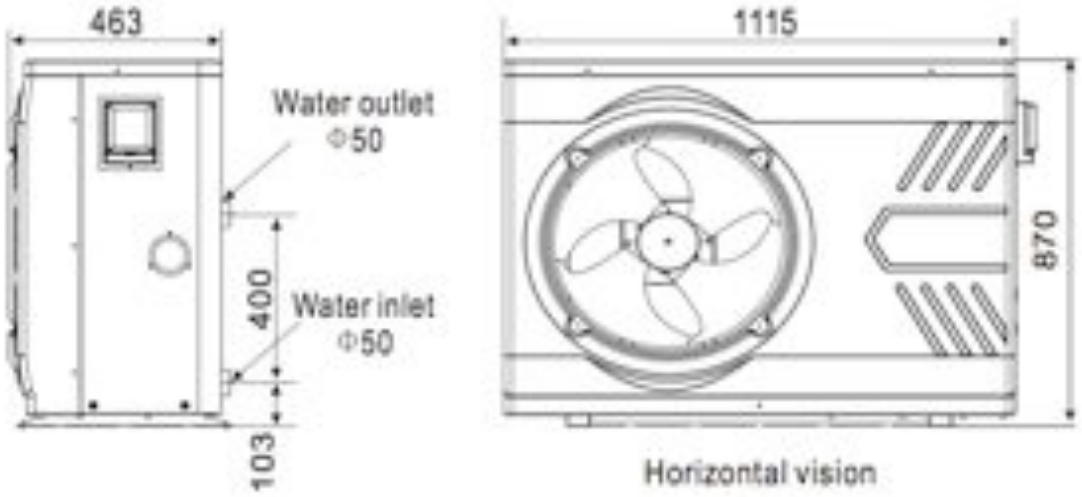
Model: **DURA-7** unit: mm



Models: **DURA-10/-13** unit: mm

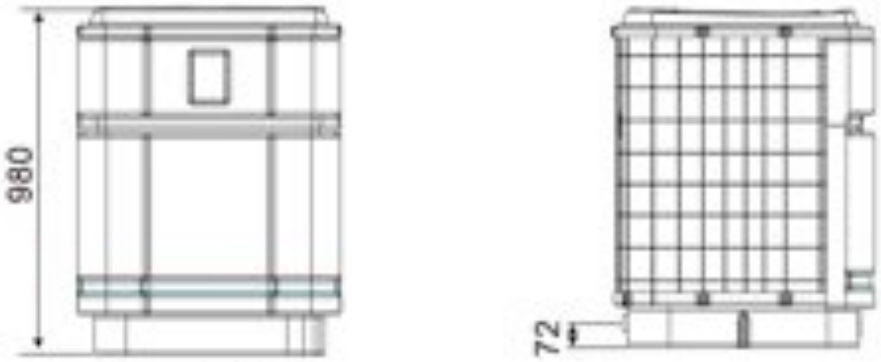


Model: **DURA-18** unit: mm



Vertical vision

Model: **DURA-22/-22T/-26T** unit: mm



Vertical vision

3. Installation and connection

3.1 Remarks

The factory only provides the heat pump unit; the other parts, including a contingent by-pass, are to be provided by the user or the installer.

Attention:

Please take the following steps when installing the heat pump:

1. Each addition of chemicals has to be performed through the conduits located **AFTER** the heat pump.
2. Install a by-pass
3. Always place the heat pump on a solid base and use the supplied **silent blocks** in order to avoid vibrations and noise.
4. Always keep the heat pump in upright position. If the unit has been tilted, you should wait for at least 24 hours before turning it on.

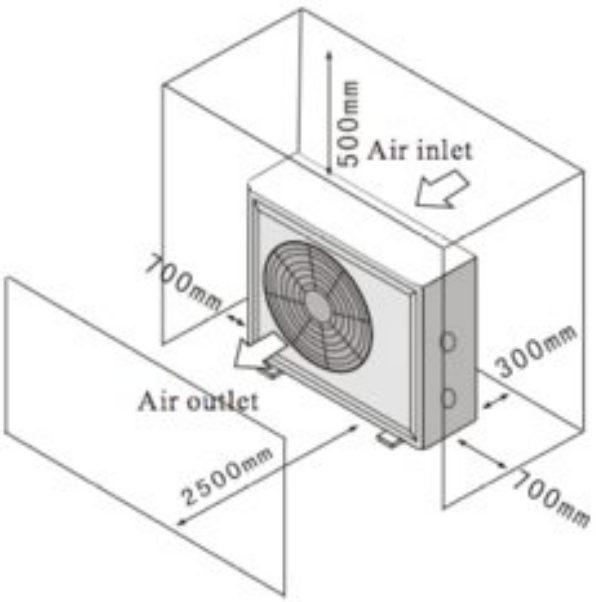
3.2 Location of the heat pump

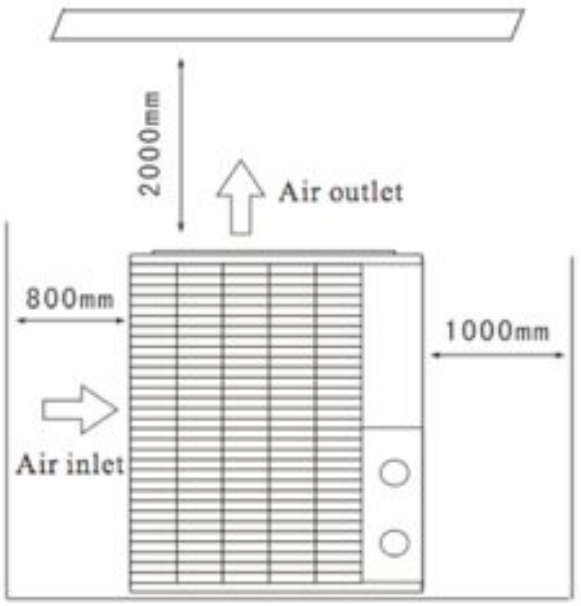
The unit will perform well on any location provided three factors are present:

1. Fresh air - 2. Electricity - 3. Pool filter piping

The unit may be installed virtually anywhere **outdoors** providing minimum distance requirements are met with respect to other objects (see diagram below). For indoor pools please consult your installer. If the unit is placed in a windy area, no problems occur with e.g. the pilot light, as opposed to what is often the case with gas heaters.

ATTENTION: Do not place the unit in an enclosed area with a limited air volume where the unit's discharged air will be re-circulated or near shrubs that could block the air inlet. These locations deny the unit a continuous fresh air supply, which reduces its efficiency and may prevent adequate heat yield.
See diagram below for minimum required distances.



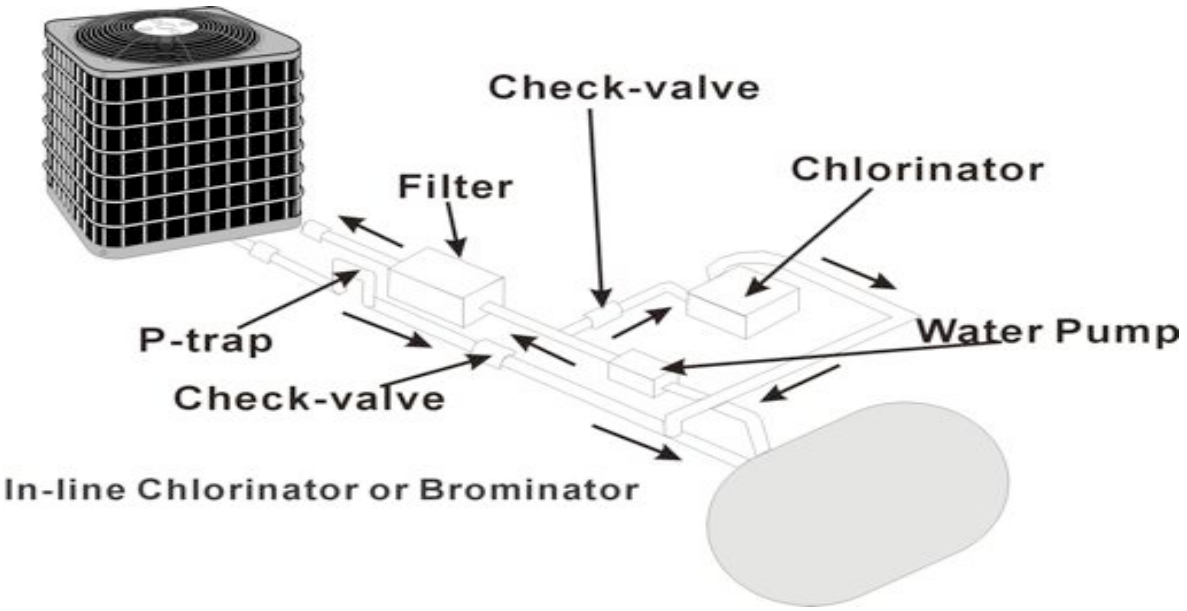


3.3 Distance from the pool

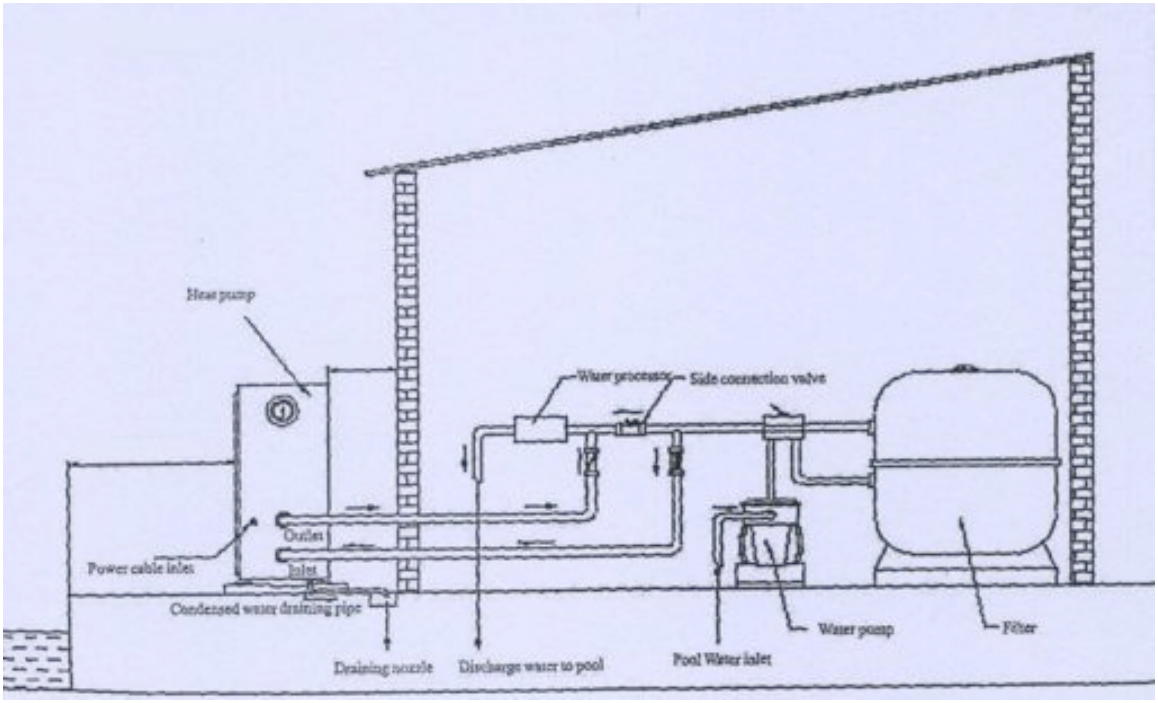
Normally, the pool heat pump is installed within a 7.5 meter radius of the pool. The greater the distance from the pool, the greater the heat loss from the piping. Since the piping is buried for the most part, heat loss is minimal for distances of up to 30 meters (15 meters to and from the pump = 30 meters total), unless the soil is wet or the water level is high. Heat loss per 30 meters could roughly be estimated at 0.6 kW-hour (2000 BTU) for every 5 °C temperature difference between the pool water and the soil surrounding the pipe, which translates to an operation time increase of 3 to 5 %.

3.4 Installation of the check-valve

Attention – When using automatic chlorine and pH dosage systems, it is of uttermost importance to protect the heat pump from high concentrations of these chemicals that could corrode the heat exchanger. Therefore, such systems should add the chemicals in the conduits located DOWNSTREAM of the heat pump and it is recommended to install a check-valve in order to prevent backflow when there is no water circulation.
Damage to the heat pump caused by disregarding any of these recommendations will invalidate the warranty.

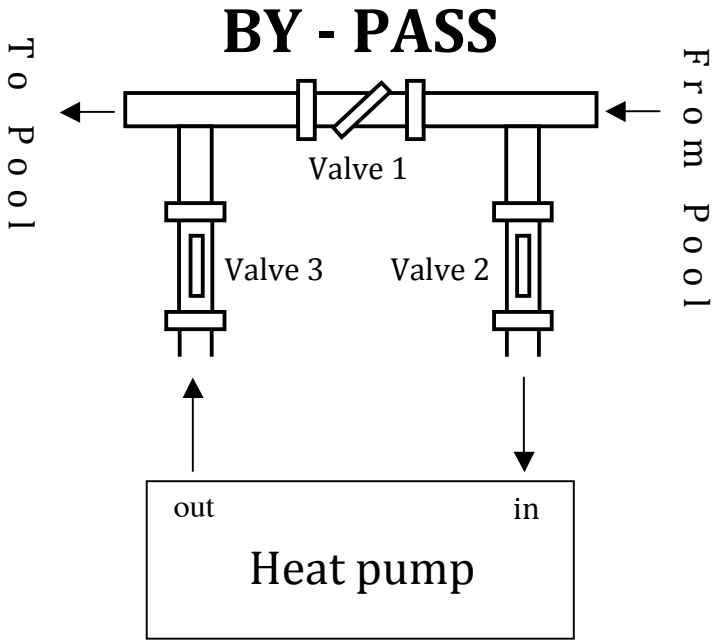


3.5 Typical setup



Note – This setup is just an example

3.6 Adjusting the by-pass



The heat pump reaches maximum efficiency when temperature difference between IN and OUT is about 1 – 2 degrees Celsius (see parameters A and B, par 4.3).
The temperature difference is influenced by the flow of water through the heat pump. The flow can be adjusted with By-pass valve 1. The flow increases when valve 1 is shut more and vice versa.

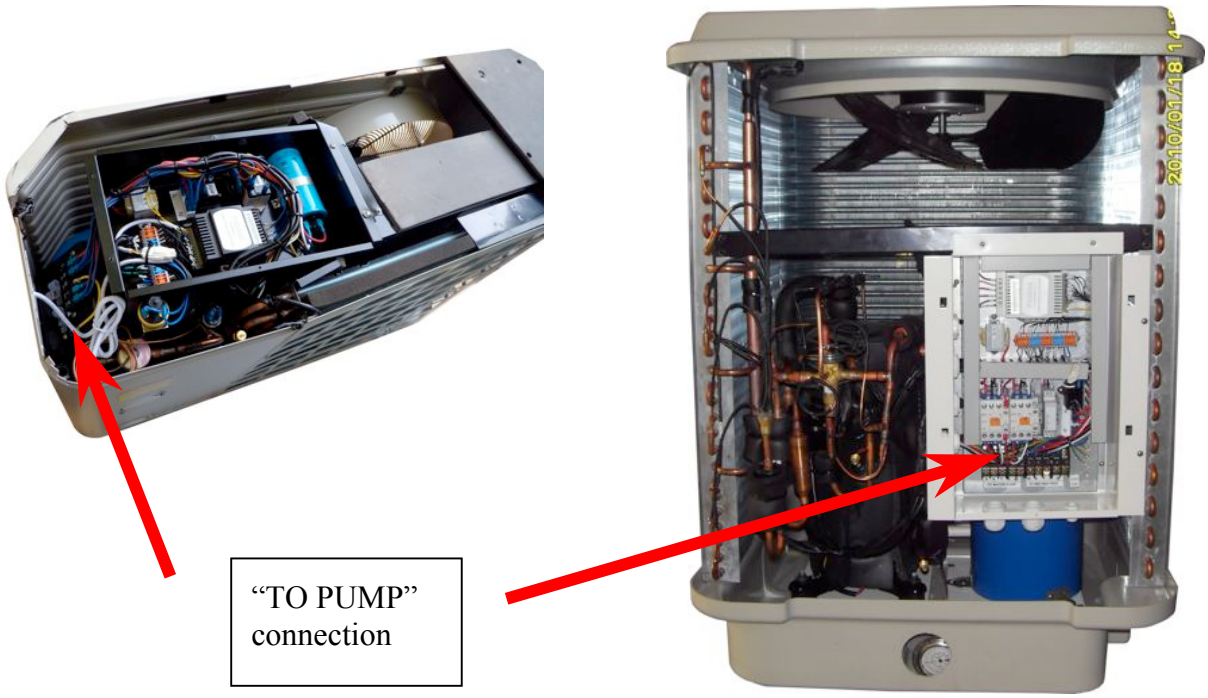
Operating pressure of the refrigerant can be monitored on the pressure gauge of the heat pump. The pressure is infuenced by water- and ambient temperature and is automatically controlled by the heat pump.

Note – The absence of a by-pass or performing an inadequate by-pass adjustment may cause the heat pump to function less well or may even damage it, which will invalidate the warranty.

3.7 Electrical hook-up

Important - Although the heat pump is electrically isolated from the rest of the unit, this only prevents the passage of electricity to or from the pool water. Grounding the unit is still required to protect yourself from short circuits inside the unit. Make for adequate ground connection.

Check if the electrical mains voltage corresponds with the operating voltage of the heat pump prior to hooking up the unit.
It is recommended to use a separate fuse (slow type – D-curve) as well as adequate wiring (see table below).
Connect the electrical wires with the terminal block labelled 'TO POWER SUPPLY'.
Next to this connection, there is a second terminal block labelled 'TO PUMP', to which the filter pump (max. 5A/240V) or an electrical relay for a filtration pump can be connected. This connection makes it possible to control filter pump operation with the heat pump. See further; paragraph 4.2 (parameter 9) for the different possibilities.



Remark – For 3 phase motors (like a compressor), switching 2 phases may cause an inversion in the rotational direction, which could damage the unit. Therefore, a protection device has been built in, which will interrupt the circuit if the connection has not been performed correctly. If, right after electrical connection has been made, the display of the pump does not illuminate, and the pump doesn't start, **2 phase wires have to be switched**.

Model	Voltage (volt)	Fuse (A)	Nominal current (A)	Cable diameter (mm^2) (for a max. length of 15 meters)
DURA-7	220-240	10	4,8	2 x 2,5 + 2,5
DURA-10	220-240	16	6,7	2*2.5 + 2.5
DURA-13	220-240	20	10,4	2*2,5 + 2.5
DURA-18	220-240	25	13,4	2*2.5 + 2.5
DURA-22	220-240	32	16,5	2 x 4 + 4
DURA-22T	3 x 400	20	6,7	4 x 2,5 + 2,5
DURA-26T	3 x 400	20	8,1	4 x 2,5 + 2,5

3.8 First time start-up

Note - In order for the unit to heat the pool (or spa), the filter pump must be running so that the water can circulate through the heat pump. Without this circulation, the heat pump will not start.

When all connections have been made and checked, you should follow these steps:

1. Turn on the filter pump. Check for leaks and verify flow to and from the pool.
2. Turn on the electrical power supply to the unit, then press the ON/OFF key "⏻" on the electronic control panel. The unit should start when the time delay period has lapsed (see further).
3. When the unit has been running for a couple of minutes, check if the air leaving the unit is cooler.
4. Check the performance of the flow switch as follows: with the unit running, turn the filter pump off. The unit should also switch off automatically. If not, the flow switch must be readjusted. (see further under 6.2).
5. Allow the unit and filter pump to run 24 hours a day until the desired pool water temperature is reached. When the set temperature is reached, the unit switches itself off. The unit will now automatically restart (as long as your filter pump is running) when the temperature of the pool water experiences a drop of more than 1 °C below the set temperature.

Depending on the starting temperature of the pool water and the air temperature, it can take several days for the water to reach the desired temperature. Covering the pool can drastically reduce this period.

Water flow switch – the unit is equipped with a flow switch that is switched on when enough water is flowing in the unit and that is switched off when the water flow becomes too low (e.g. when the filter pump is switched off).

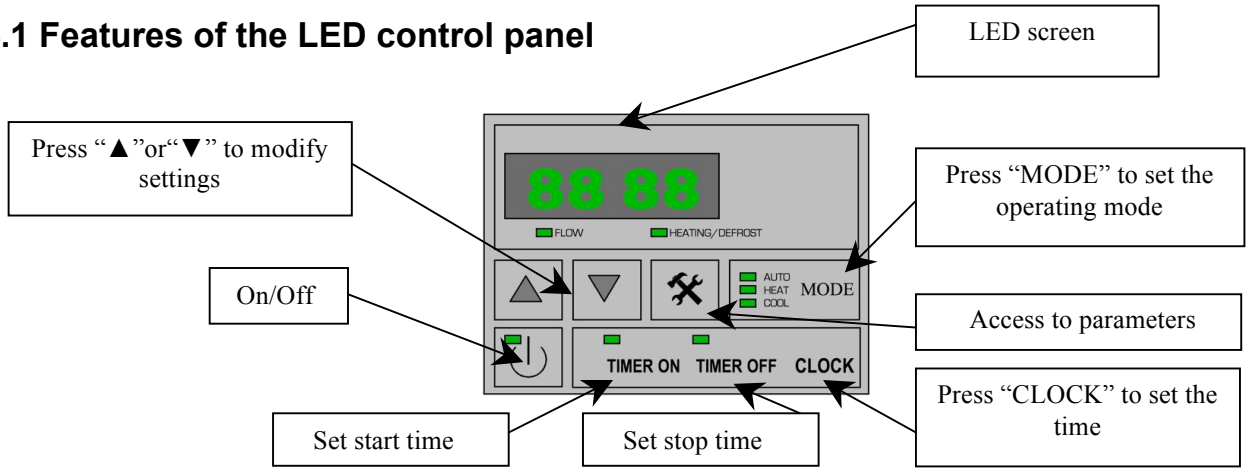
Time delay – the unit is equipped with a built-in 3-minute start delay included to protect the compressor and electrical contacts. After this time delay, the unit will automatically be restarted. Even a brief interruption of the power supply will activate the start delay and prevent the unit from starting immediately. Additional interruptions of the power supply during the delay period will have no effect on the 3-minute countdown.

3.9 Condensation

When the swimming pool water is being heated by the heat pump, the incoming air is cooled down quite a bit, which can cause condensation on the fins of the evaporator. Condensed volumes can attain several litres per hour under high atmospheric humidity. Sometimes, this is wrongfully interpreted as a water leak.

4. Use and operation

4.1 Features of the LED control panel



With the "On/Off" key "⏻ ", the heat pump is turned on or turned off (stand-by status). If the LED next to this key lights up, the heat pump is turned ON.

Setting the desired temperature of the swimming pool water is achieved with the arrow keys, regardless if the heat pump is turned ON or OFF. You simply press the arrow keys to set the desired temperature **directly**.

- When the unit is turned ON and is running, the temperature of the swimming pool water can be read off the LED screen.
- When the unit is turned ON and the desired temperature is reached, "OFF" appears on the LED screen.
- When the unit is turned OFF, "OFF" is always displayed on the LED screen; the heat pump goes on monitoring all parameters of the system and all protection systems remain active. The heat pump is thus in STAND-BY mode. We will continue using this expression if we wish to indicate that the heat pump is turned OFF.

4.2 Setting the parameters

Parameters can always be checked by pressing the service key "🛠", regardless if the pump is turned ON or is in STAND-BY mode. **Only** in STAND-BY mode can the parameters be modified.

This is an overview of the different parameters and their standard values.

The first number on the LED screen stands for the number of the parameter and the second one for its value.

Parameter	Description	Standard
0	Desired temperature in cooling mode (8 ⇒ 28°C)	20°C
1	Desired temperature in heating mode (7 ⇒ 40°C)	27°C
2	Operation time of the compressor before defrosting mode starts (30 ⇒ 90 minutes)	45 min
3	Temperature of evaporator at which defrosting starts (-30 ⇒ 0°C)	-7°C
4	Temperature of evaporator at which defrosting stops (2 ⇒ 30°C)	13°C
5	Maximum duration of defrosting procedure (0 ⇒ 12 min)	8 min
6	Mode of electronic expansion valve (0=manual/1=automatic)	1
7	Memory function for automatic start-up (0 for 'no' and 1 for 'yes')	1
8	Operating mode (see table below)	2
9	Filter pump control (see table below)	0
10	Fan mode (see table below)	2
11	Fan control type (0 for triac control and 1 for voltage control)	1
12	Lowest FAN control	50%
13	Highest FAN control	100%
14	Superheat value	3
15	Expansion valve position at rest	35

Parameters 2 up to and including 5 are the settings for the automatic defrosting mode. They have been set from the factory for optimal operation and **very rarely** need to be adjusted by a specialized technician, that is, only if conditions demand it.

Parameter 7 indicates if the heat pump should or shouldn't start automatically after an interruption of the power supply.

Parameter 8 is for adjusting the **possible** operating modes of the heat pump.

Value for parameter 8	**Possible modes**	**Can be selected with "Mode" key**
2	Heating only	Yes

Parameter 9 is for determining how the filter pump should be controlled. If you want to have it controlled by the heat pump, you have to connect the electrical wires of this pump, through a separate relay, to the terminal block labelled 'TO PUMP' that is located next to the one labelled 'TO POWER SUPPLY'.

Value for parameter 9	**Control**
0	The filter pump runs all the time
1	The filter pump runs as long as the compressor is turned ON
2	Intermittent operation: runs for 3 minutes every 30 minutes when compressor has stopped

Parameter 10 sets the desired operation mode for the fan speed.

Value for parameter 10	Fan control
0	Low fan speed
1	High fan speed
2	Automatic fan speed (high speed when air temperature is below 10°C, low speed when higher than 15°C)
3	Low fan speed between 9PM and 8AM, high speed at other time
4	Automatic running according to a combination of value 2 and 3

Parameters are modified as follows:

- Set the heat pump in its STAND-BY mode.
- Press the service key "🛠"to access the parameter menu. The parameter number and its value will blink simultaneously.
- Press the arrow key "▲"or"▼" to select the desired parameter.
- Then press "MODE" and "⏻" simultaneously. Now, only the value of the parameter will be blinking.
- Then select the desired setting with the arrow key "▲"or"▼".
- Stop for 5 seconds or press the service key to save the new setting. The LED screen will again display "OFF".

Only parameters 0 and 1 (depending on the selected mode) are set directly with "▲"or"▼"

4.3 Checking the status

Further down in the parameter menu, after numbers from 0 to 11, you encounter parameters A to E.
These cannot be modified. They indicate the values the unit is currently measuring for these parameters.

Parameter	Measured value
A	Temperature of in flowing water (-9 ⇒ 99°C)
B	Temperature of out flowing water (-9 ⇒ 99°C)
C	Temperature of evaporator (-9 ⇒ 99°C)
D	Temperature of refrigerant at compressor inlet (-9 ⇒ 99°C)
E	Ambient temperature (-9 ⇒ 99°C)
F	Position of expansion valve (0 ⇒ 50 ; N*10)

4.4 Setting the CLOCK

- Start setting the clock by pressing the “CLOCK” key. The LED screen will display the time and the hours will start to blink.
- Press “▲”or“▼” to set the desired hour.
- Press “CLOCK” again. Now, the minutes start blinking.
- Press “▲”or“▼” again to set the minutes.
- Press “CLOCK” again to save the settings.

While setting the clock, the “TIMER ON” and “TIMER OFF” keys are inactive.

4.5 Use of timers

Timers allow you to set a time window in which the heat pump will be active. If you want the heat pump to work only during the day, you can for instance set the “TIMER ON” key to 08:00 and the “TIMER OFF” key to 20:00. Setting the time can only be achieved when the pump is turned ON. When it is in STAND-BY mode, timers are automatically deactivated.

4.5.1 Setting TIMER ON

The “TIMER ON” key activates the time at which the heat pump is automatically turned on.

- Start setup by pressing the “TIMER ON” key. This displays the previously set time on the LED screen and makes it blink.
- Press “TIMER ON” again. Now, only the hours start blinking.
- Press “▲”or“▼” to set the desired hour.
- Press “TIMER ON” again. Now, the minutes start blinking.
- Press “▲”or“▼” again to set the minutes.
- Press “TIMER ON” again to save the setting and to activate start time.

Deactivation of “TIMER ON” when the heat pump is turned ON is achieved as follows:

- Press “TIMER ON”. The set time appears and starts blinking.
- Now, press “CLOCK” to deactivate the timer.

4.5.2 Setting TIMER OFF

The “TIMER OFF” key activates the time at which the heat pump will automatically stop.

- Start setup by pressing the “TIMER OFF” key. This displays the previously set time on the LED screen and makes it blink.
- Press “TIMER OFF” again. Now, only the hours start blinking.
- Press “▲”or“▼” to set the desired hour.
- Press “TIMER OFF” again. Now, the minutes start blinking.
- Press “▲”or“▼” again to set the minutes.
- Press “TIMER OFF” again to save the setting and to activate stop time.

Deactivation of “TIMER OFF” when the heat pump is turned ON is achieved as follows:

- Press “TIMER OFF”. The set time appears and starts blinking.
- Now, press “CLOCK” to deactivate the timer.

5. Protection systems

DURA heat pumps are equipped with the following standard protection systems:

5.1 Flow switch

Thanks to this flow switch, the heat pump will not work when the filter pump is not working (and the water is not circulating). This system prevents the heat pump from heating only the water present in the heat pump itself. The protection also stops the heat pump if water circulation is cut off or stopped.

5.2 Refrigerant gas high and low pressure protection

The high pressure protection makes sure the heat pump is not damaged in case of over-pressurisation of the gas. The low pressure protection emits a signal when refrigerant is escaping from the conduits and the unit cannot be kept running.

5.3 Overheating protection on the compressor

This protection protects the compressor from overheating.

5.4 Automatic defrost control

When the air is very humid and cold, ice can form on the evaporator. In that event, a thin layer of ice appears that will grow increasingly bigger as long as the heat pump is running. When the temperature of the evaporator has become too low, automatic defrost control will be activated, which will reverse the heat pump cycle so that hot refrigerant gas is sent through the evaporator during a brief period of time to defrost it.

5.5 Temperature difference between inflowing and outflowing water

During normal operation of the heat pump, the temperature difference between inflowing and outflowing water will approximate 1 to 2 °C. In the event that the pressure switch does not work and that the water stops circulating, the temperature probe monitoring the outflowing water will always detect a rise in temperature. As soon as the temperature difference between inflowing and outflowing water exceeds 13 °C, the heat pump will be automatically turned off.

5.6 Low temperature cut-out

If, during cooling, the temperature of the outflowing water reaches 5 °C or drops below this temperature, the heat pump will turn itself off until the water temperature reaches or exceeds 7 °C again.

5.7 Anti-frost protection during winter

This protection can only be activated if the heat pump is in STAND-BY mode.

5.7.1 First anti-frost protection

If the filter pump is controlled by the heat pump (regardless of the value for parameter 9) and when the water temperature lies between 2 and 4 °C and the air temperature is lower than 0 °C, the filter pump will be automatically turned on to prevent the water from freezing in the piping. This protection is deactivated when the temperature rises again.

5.7.2 Second anti-frost protection

If the water temperature drops even more, that is, below 2 °C (during long frost periods), the heat pump will also start running to heat the water until its temperature approximates 3 °C. When this temperature is reached, the heat pump will stop, but anti-frost protection will remain active until conditions change.

6. Directions

6.1 Swimming pool water chemistry

Special attention should be paid to the chemical balance of the pool water. The pool water values should always stay within the following limits:

	Min.	Max.
pH	7.0	7.8
Free chlorine (mg/l)	0.5	1.2
TAC (mg/l)	80	150
Salt (g/l)		8

Important: failure to comply with these limits will invalidate the warranty.

Note: exceeding one or several limits can damage the heat pump beyond repair. Always install water treatment equipment past the heat pump's water outlet, especially if the chemicals are automatically added to the water.
A check-valve should also be installed between the outlet of the heat pump and this equipment in order to prevent products from flowing back into the heat pump if the filter pump stops.

6.2 Heat pump winterizing

Important: failure to take the necessary precautions for winterizing can damage the heat pump, which will invalidate the warranty.

The heat pump, filter pump, filter and conduits must be protected in areas where the temperature can drop below the freezing point. Evacuate all water from the heat pump as follows:
1. interrupt the electrical power supply to the heat pump
2. close the water supply to the heat pump: completely close valves 2 and 3 of the by-pass
3. disconnect the water inlet and outlet coupler fittings of the heat pump and let the water drain out of the unit
4. loosely reattach water inlet and outlet coupler fittings to the heat pump in order to prevent dirt from getting into the conduits.

Note: these precautions should not be taken if you choose to use the built-in anti-frost protection.

6.3 Restarting the pump after winter

If you purged your heat pump for winterizing, you should undertake the following steps to restart it in spring:
1. check first if there is no dirt in the conduits and if there are no structural problems
2. check if the water inlet and outlet coupler fittings are adequately fastened to the heat pump
3. start the filter pump to start the water flow to the heat pump. Set the by-pass again.
4. reconnect the electrical power supply to the heat pump and turn it ON.

6.4 Check-up

DURA heat pumps have been developed and built to last, that is, if they have been installed correctly and can run under normal conditions. Regular check-ups are important if you want your heat pump to function safely and efficiently for years on end.
The following directions can help you achieve optimal results:

1. make for easy access to the service panel
2. keep the area surrounding the heat pump free of contingent organic waste
3. prune the vegetation near the heat pump so that there is enough free space around the pump
4. remove contingent water sprinklers from the vicinity of the heat pump. They can damage the heat pump.
5. prevent rain from directly running off a roof onto the heat pump. Install proper drainage.
6. do not use the heat pump if it has been flooded. Immediately contact a qualified technician to inspect the heat pump and repair it if should prove necessary.

Condensation can occur when the heat pump is running. This condensation can flow away through an opening in the base pan of the unit. The amount of condensation water will increase when atmospheric humidity is high. Remove any dirt that could possibly hamper the evacuation of condensation.
10 to 20 litres of condensation water can be produced while the unit is running. If more condensation is produced, stop the heat pump and wait for one hour before checking for leaks in the conduits.

NOTE: A quick way to verify that the water running through the condensation drain is indeed condensation, is to shut off the unit and keep the pool pump running. If the water stops running out of the condensation drain, it is condensation. AN EVEN QUICKER WAY is to TEST THE DRAIN WATER FOR CHLORINE. If no chlorine is detected, the drain water is a result of condensation.

Also take care to leave air inlet and exhaust passages free. Prevent exhaust air from immediately re-entering the unit through the inlet.

7. Maintenance and inspection

7.1 Maintenance

- Check the water inlet and drainage often. The water and air inflow into the system should be sufficient so that its performance and reliability does not get compromised. You should clean the pool filter regularly to avoid damage to the unit caused by clogging of the filter.
- The area around the unit should be spacious and well ventilated. Clean the sides of the heat pump regularly to maintain good heat exchange and to save energy.
- Check if all processes in the unit are operational and pay special attention to the operation pressure of the refrigerant system.
- Check the power supply and cable connections regularly. Should the unit begin to function abnormally or should you notice a smell from an electrical component, arrange for timely repair or replacement.
- Winterizing : make sure to purge all the water from the heat pump and other systems in order to prevent frost damage.
- You should also purge the water if the unit will not work for an extended period of time. You should check all parts of the unit thoroughly and completely fill the system with water before turning it on again afterwards.

7.2 Troubleshooting guide

Improper installation may result in an electrical discharge that could lead to death of – or serious injury to – pool users, installers or others due to electrical shock and may also cause damage to property.

DO NOT attempt to modify the internal configuration of the heat pump.

1. Keep your hands and hair clear of the fan blades to avoid injury.
2. If you are not familiar with your pool filtering system and heat pump:
    a. **Do not** attempt to adjust or service without consulting your dealer or your professional pool or air conditioning contractor.
    b. Read the entire installation and user manual before attempting to use, service or adjust the unit.
    c. Start the heat pump at least 24 hours after its installation in order to prevent damage to the compressor.

Nota: Switch off the power prior to maintenance or repairs.

Important remark: if a malfunction cannot be resolved immediately, **your installer** can contact our customer service. To be able to help you, we will need the **serial number** of your heat pump.
In order to analyse the problem itself, we will need to know the message (error code) that is displayed on the LED screen, as well as the values for the settings (parameters 0 to 15) and for the status of the heat pump (parameters A to F) just before the failure or, if this is impossible, just after it.
Please keep this information at hand when calling our customer service. This information is also indispensable if you need to return a heat pump. Returning the unit should occur according to our **RMA procedure** guidelines.

On the following pages, you will find an overview of the different types of failure problems that can occur, along with directions to solve them.

Problem:	the heat pump doesn't work
Observation:	the screen does not light up and the fan/compressor doesn't make a sound
Possible cause	**Solution**
No electrical power supply	Check power supply (wiring, fuses, ...)

Problem:	the heat pump doesn't work
Observation:	the screen displays "OFF" and the LED next to "⏻" is **not** lit
Possible cause	**Solution**
The pump is in stand-by mode	Turn on the pump

Problem:	the heat pump doesn't work
Observation:	the screen displays "OFF" and the LED next to "⏻" **is** lit
Possible cause	**Solution**
1. The set temperature has been reached	1. No action required; all is well
2. The heat pump isn't functioning yet	2. Wait until the start time delay period has lapsed (3 minutes)

Problem:	the heat pump works but doesn't heat
Observation:	the compressor is running but the fan isn't and the "HEATING/DEFROST" LED is blinking
Possible cause	**Solution**
The defrosting cycle is running	No action required; all is well

Problem:	the heat pump works normally but there is no or insufficient heating
Observation:	the screen displays the temperature but no error codes
Possible cause	**Solution**
1. Insufficient capacity of the heat pump in proportion to the size of the swimming pool	1. Install a larger sized model or an extra heat pump. Cover the pool to limit heat loss
2. The compressor works but the fan doesn't	2. Check the electrical wiring of the fan. Replace the condenser or the fan motor if necessary.
3. The fan works but the compressor doesn't	3. Check the electrical wiring of the compressor. Replace the condenser or the compressor if necessary.
4. The heat pump has not been placed on an optimal location	4. Make for sufficient air circulation (see manual for details)
5. Faulty temperature setting	5. Set the correct temperature
6. By-pass not adjusted	6. Have the by-pass readjusted by the installer
7. Massive ice formation on the evaporator	7. Have the settings for automatic defrost control checked by the installer
8. Not enough refrigerant	8. Have the heat pump checked by a refrigeration technician

Problem:	the heat pump works normally but the water is cooling down instead of heating up
Observation:	the screen displays the temperature but no error codes
Possible cause	**Solution**
1. The wrong mode has been selected	1. Verify the parameters, select the correct mode
2. The controller is out of order	2. Check the voltage in the electrical wiring to the 4-way valve. If no electric potential is measured, replace the controller
3. The 4-way valve is out of order	3. Check the voltage in the electrical wiring to the 4-way valve. If electric potential is measured, replace the coil. If the problem persists, have the heat pump checked by a refrigeration technician

Problem:	the heat pump works but stops after a short while
Observation:	the screen displays “OFF”
Possible cause	**Solution**
1. Wrong setting of parameters	1. Check the settings of the parameters and modify if necessary

Problem:	the heat pump doesn’t stop
Observation:	the screen displays the temperature but no error codes
Possible cause	**Solution**
1. Wrong setting of parameters	1. Check the set parameters and adjust them if necessary (settings just above the capacity of the heat pump)
2. Pressure switch out of order	2. Check operation of the pressure switch by turning off the filter pump and restarting it. If the heat pump doesn’t react to this, the pressure switch must be adjusted or replaced.
3. Electrical failure	3. Contact your installer

Problem:	water leak
Observation:	there’s an amount of water under the heat pump
Possible cause	**Solution**
1. Condensation due to atmospheric humidity	1. No action required
2. Water leak	2. Try to localize the leak and check for the presence of chlorine in the water. If that is the case, the heat pump must be temporarily replaced during repair.

Problem:	abnormal amount of ice formed on the evaporator
Observation:	the evaporator is for the most part covered in ice
Possible cause	**Solution**
1. Insufficient air inflow	1. Check the location of the heat pump and remove any dirt that could be present on the evaporator
2. High water temperature	2. If the pool water is already quite hot (warmer than 29 °C), the probability of ice formation increases. Lowering the set temperature is a possible option.
3. Incorrect setting of automatic defrost control	3. Check the settings of the defrosting function together with your installer
4. The 4-way valve is out of order	4. Check the voltage in the electrical wiring to the 4-way valve. If electric potential is measured, replace the coil. If the problem persists, have the heat pump checked by a refrigeration technician.
5. Not enough refrigerant	5. Have the heat pump checked by a refrigeration technician.

7.3 Overview of possible error codes displayed on the screen

Go back to chapter 5 **"Protection systems"** for more detailed information.

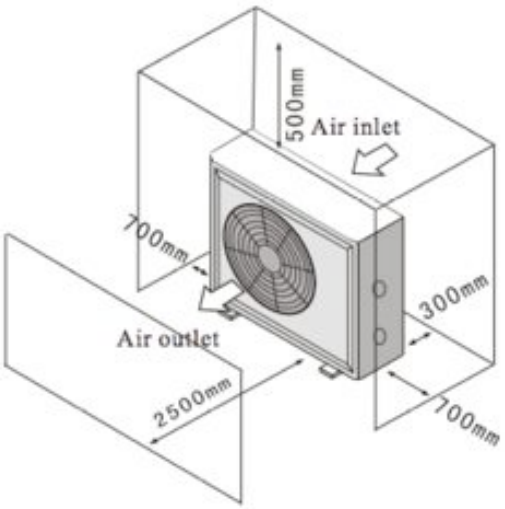
The heat pump screen displays one of the following codes:

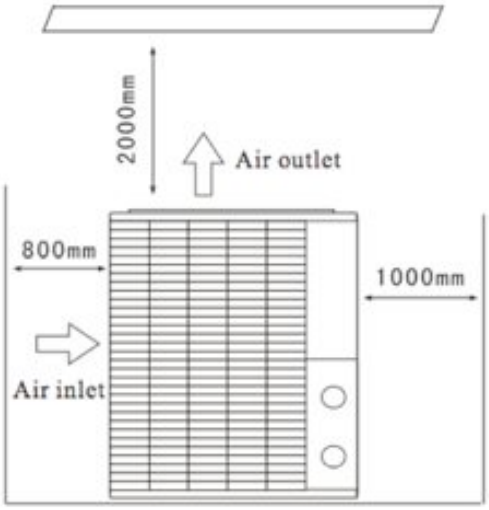
Display	Problem	Cause	Solution
PP1	"WATER IN" sensor out of order	Sensor open or short-circuited	Check or replace the sensor
PP2	"WATER OUT" sensor out of order	Sensor open or short-circuited	Check or replace the sensor
PP3	"PIPE" sensor out of order	Sensor open or short-circuited	Check or replace the sensor
PP4	"SUCTION" sensor out of order	Sensor open or short-circuited	Check or replace the sensor
PP5	"AIR" sensor out of order	Sensor open or short-circuited	Check or replace the sensor
PP6	Temperature difference between "WATER IN" and "WATER OUT" is too large	Insufficient water flow	Check the water flow
		Pressure switch out of order	Replace the pressure switch
PP7	Water temperature too low during cool-down	Insufficient water flow	Check the water flow
		Sensor "WATER OUT" displays an incorrect message	Check or replace the sensor
PP7	First anti-frost protection active	Low temperatures for water and air	No action required
PP7	Second anti-frost protection active	Low temperatures for water and air	No action required
HP	High pressure protection	Insufficient water flow	Check the water flow
		Pressure switch out of order	Replace the pressure switch
		Too much refrigerant gas present	Have the heat pump checked by a refrigeration technician
LP	Low pressure protection	Not enough refrigerant gas	Have the heat pump checked by a refrigeration technician
		Leak in the cooling conduits	Have the heat pump checked by a refrigeration technician
FLO	Insufficient water flow	Insufficient water flow	Check the water flow
		Pressure switch out of order	Replace the pressure switch
EE5	The temperature difference between "WATER IN" and "WATER OUT" has been too large 3 times in a row	Insufficient water flow	Check the water flow
		Pressure switch out of order	Replace the pressure switch
EE8	Communication failure	No communication between the digital display and the system controller	Check the connection between the screen and the controller. Replace screen and/or controller.

7.4 Check list for installation

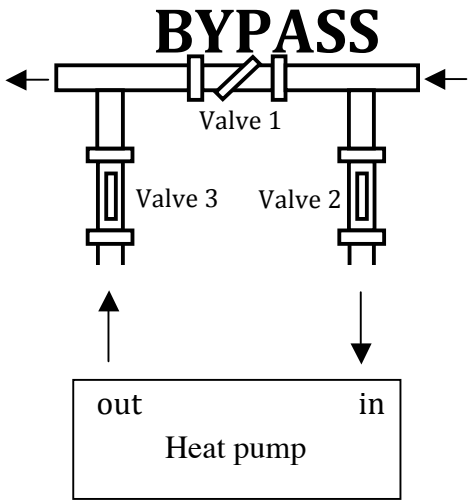
ATTENTION / OPGELET / ATTENTION / ACHTUNG

1. Free area / vrije ruimte / espace libre / freier platz





2. Install a by-pass / installeer een by-pass / installez un by-pass / installieren sie eine Überbrückung



3. Electrical connection / elektrische aansluiting / raccordement électrique / elektrischer Anschluss

DURA-7	220-240V	10A	2*2,5 + 2,5mm^2
DURA-10	220-240V	16A	2*2,5 + 2,5 mm^2
DURA-13	220-240V	20A	2*2,5 + 2,5 mm^2
DURA-18	220-240V	25A	2*4 + 4 mm^2
DURA-22	220-240V	32A	2*4 + 4 mm^2
DURA-22T	3x 400V	20A	4*2,5 + 2,5 mm^2
DURA-26T	3x 400V	20A	4*2,5 + 2,5 mm^2

Read the installation manual for more detailed instructions

Lees aandachtig de instructies in de installatiehandleiding

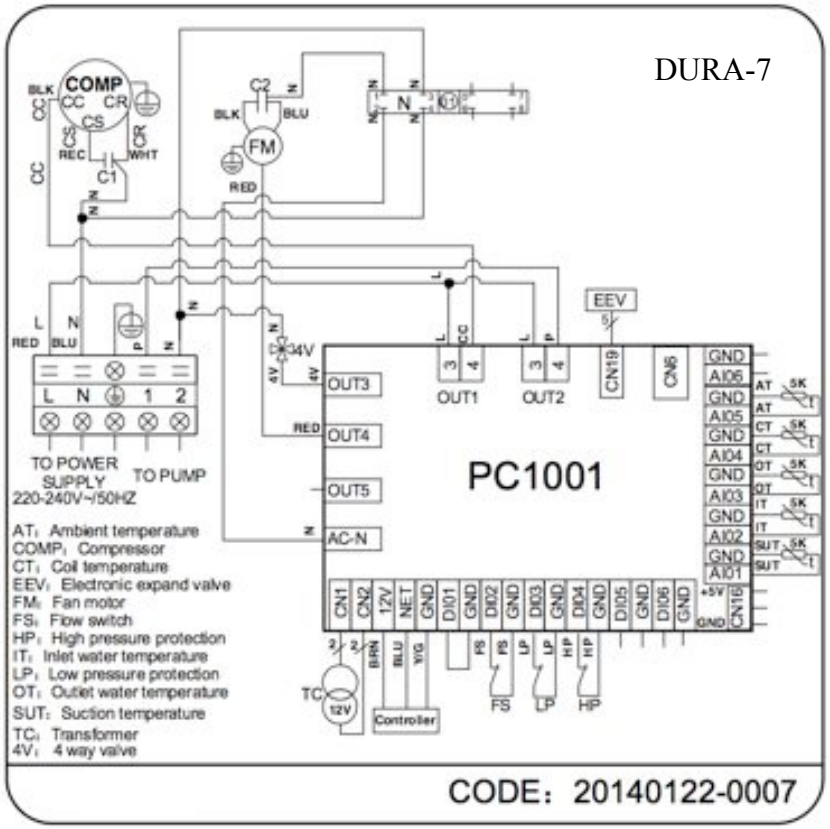
Lisez les instructions dans le manuel d'installation

Lesen sie die Anweisungen im Installation Handbuch

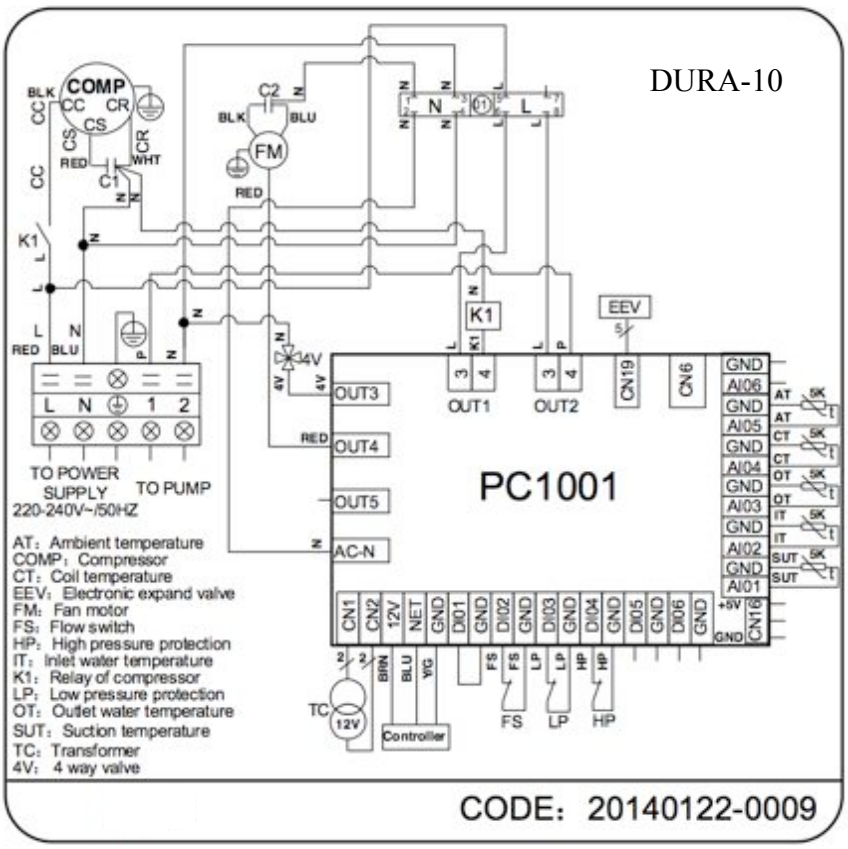
8. Detailed specifications

8.1 Electrical diagrams

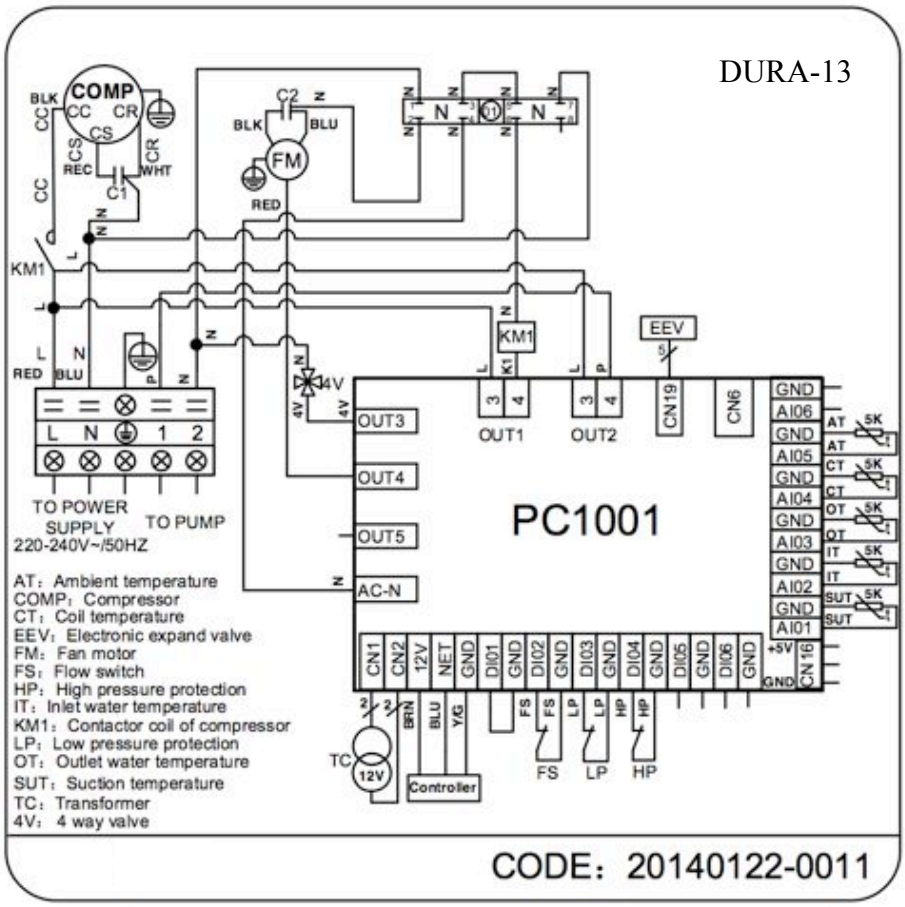
DURA-7



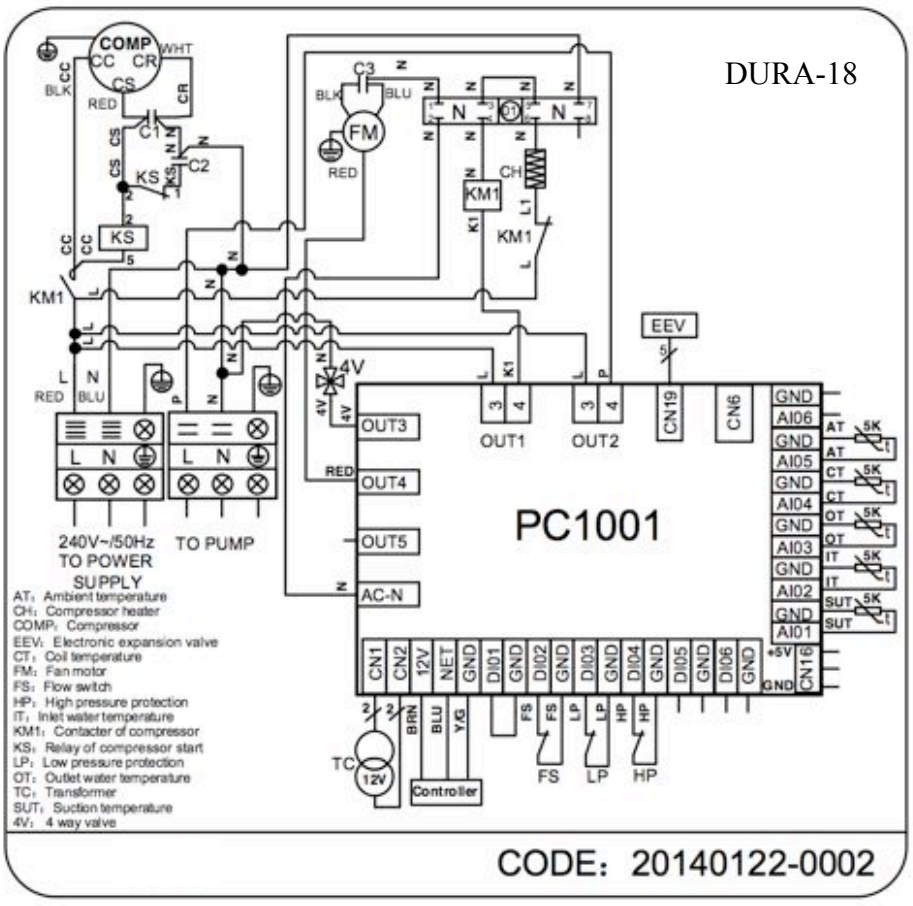
DURA-10

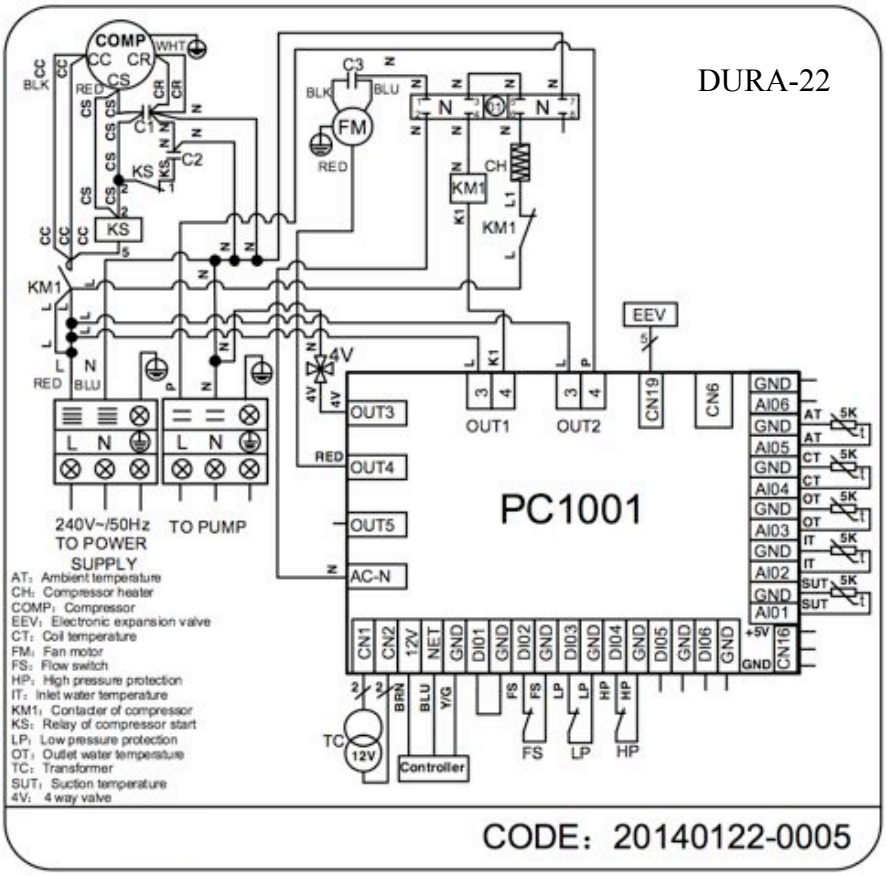


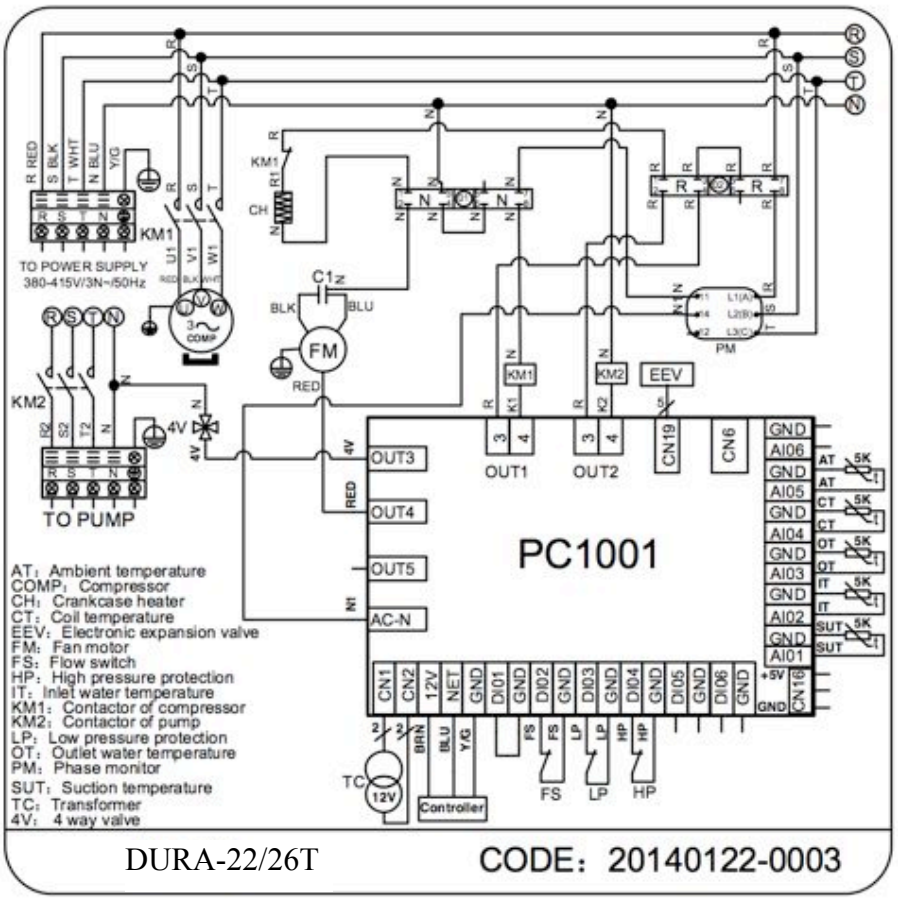
DURA-13



DURA-18

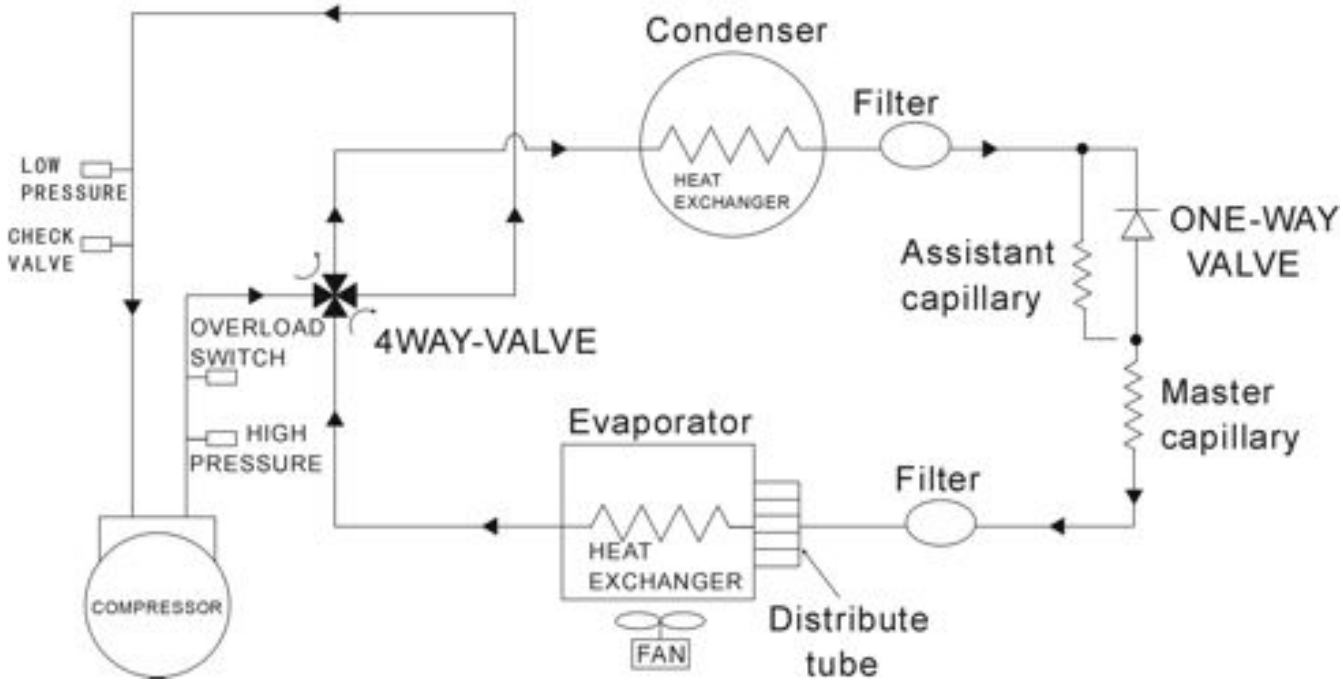



DURA-22
PC1001
240V~/50Hz
TO POWER
SUPPLY
TO PUMP
AT：Ambient temperature
CH：Compressor heater
COMP：Compressor
EEV：Electronic expansion valve
CT：Coil temperature
FM：Fan motor
FS：Flow switch
HP：High pressure protection
IT：Inlet water temperature
KM1：Contacter of compressor
KS：Relay of compressor start
LP：Low pressure protection
OT：Outlet water temperature
TC：Transformer
SUT：Suction temperature
4V：4 way valve
CODE：20140122-0005


TO POWER SUPPLY
380-415V/3N~/50Hz
TO PUMP
PC1001
AT：Ambient temperature
COMP：Compressor
CH：Crankcase heater
CT：Coil temperature
EEV：Electronic expansion valve
FM：Fan motor
FS：Flow switch
HP：High pressure protection
IT：Inlet water temperature
KM1：Contactor of compressor
KM2：Contactor of pump
LP：Low pressure protection
OT：Outlet water temperature
PM：Phase monitor
SUT：Suction temperature
TC：Transformer
4V：4 way valve
DURA-22/26T
CODE：20140122-0003

8.2 Refrigeration diagram

Refrigerant Circuit diagram:



9. Warranty

9.1 Warranty

LIMITED WARRANTY

Thank you for purchasing our heat pump.

We warrant all parts to be free from manufacturing defects in materials and workmanship for a period of two years from the date of retail purchase.

This warranty is limited to the first retail purchaser, is not transferable, and does not apply to products that have been moved from their original installation sites. The liability of the Manufacturer shall not exceed the repair or replacement of defective parts and does not include any costs for labour to remove and reinstall the defective part, transportation to or from the factory, and any other materials required to make the repair. This warranty does not cover failures or malfunctions resulting from the following:

1. Failure to properly install, operate or maintain the product in accordance with our published "Installation & Instruction Manual" provided with the product.
2. The workmanship of any installer of the product.
3. Not maintaining a proper chemical balance in your pool **[pH level between 7,0 and 7,8. Total Alkalinity (TA) between 80 to 150 ppm. Free Chlorine between 0,5 – 1,2mg/l. Total Dissolved Solids (TDS) less than 1200 ppm. Salt maximum 8g/l]**
4. Abuse, alteration, accident, fire, flood, lightning, rodents, insects, negligence or acts of Gods.
5. Scaling, freezing or other conditions causing inadequate water circulation.
6. Operating the product at water flow rates outside the published minimum and maximum specifications.
7. Use of non-factory authorized parts or accessories in conjunction with the product.
8. Chemical contamination of combustion air or improper use of sanitizing chemicals, such as introducing sanitizing chemicals upstream of the heater and cleaner hose or through the skimmer.
9. Overheating, incorrect wire runs, improper electrical supply, collateral damage caused by failure of O-rings, DE grids or cartridge elements, or damage caused by running the pump with insufficient quantities of water.

LIMITATION OF LIABILITY
This is the only warranty given by Manufacturer. No one is authorized to make any other warranties on our behalf.
THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING BUT NOT LIMITED TO ANY IMPLIED WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE AND MERCHANTABILITY. WE EXPRESSLY DISCLAIM AND EXCLUDE ANY LIABILITY FOR CONSEQUENTIAL, INCIDENTAL, INDIRECT OR PUNITIVE DAMAGES FOR BREACH OF ANY EXPRESSED OR IMPLIED WARRANTY.
This warranty gives you specific legal rights, which may vary, by country.

WARRANTY CLAIMS
For prompt warranty consideration, contact your dealer and provide the following information: proof of purchase, model number, serial number and date of installation. The installer will contact the factory for instructions regarding the claim and to determine the location of the nearest service center.

All returned parts must have a **Return Material Authorization number** to be evaluated under the terms of this warranty.